

### *Mesotrophic...eutrophic...what is it and why should I care?*

Scientists like to classify lakes and give names to the different lake types so they can be easily referred to. Trophic states are lake classifications based on lake fertility. The root "trophy" means nutrients; therefore, lakes are classified based on the amount of available nutrients (phosphorous and nitrogen) for organisms. More fertile lakes have more nutrients and therefore more plants and algae. Nutrients in lakes are like most things, a little is a good thing and too much is bad.

The trophic state classifications are as follows:

- Oligotrophic (least nutrients)
- Mesotrophic
- Eutrophic
- Hypereutrophic (most nutrients)

Oligotrophic lakes are typically very clear, deep lakes with a low nutrient content. On the other extreme are hypereutrophic lakes, which are very nutrient-rich lakes characterized by frequent and severe nuisance algal blooms and poor water visibility. The water quality of hypereutrophic lakes is poor and cannot sustain the fish species preferred by sport fishermen. Shawano Lake is neither oligotrophic or hypereutrophic. It is highly unlikely Shawano Lake will ever be classified as oligotrophic as it is a relatively shallow lake, and hopefully will never deteriorate to the point where it would be classified as hypereutrophic.

*So where does that leave Shawano Lake. Is it a healthy lake? How is it classified - mesotrophic or eutrophic?*

Let's start by defining these classifications:

- **Mesotrophic:** "Meso" means middle, or mid; therefore, mesotrophic means a medium amount of nutrients. Mesotrophic lakes commonly have clear water with beds of submerged aquatic plants and medium levels of nutrients. They are great fishing lakes and are home to many sport fish such as walleye, perch, bass, muskie and northern pike. As the water warms during the summer there can be late summer algal blooms. The water also stratifies during the summer, meaning the top layer of water becomes warm from the sun and the bottom layer remains cooler. As organisms die and decompose at the bottom of the lake, oxygen gets used up. Since the bottom layer of water does not mix with the top layer in the summer, oxygen cannot be replenished. Because fish cannot live where there is no oxygen they may have to move to shallower water in late summer where there is still oxygen, but the warm temperature of the shallow water can be very stressful to the fish.
- **Eutrophic:** "Eu" means true; eutrophic literally means true nutrients or truly nutrient rich. Eutrophic lakes are often found where there is a lot of farmland. Eutrophic lakes are shallow and have murky water and mucky, soft bottoms. They also have a lot of plants and algae. In less eutrophic lakes, common fish include largemouth bass, northern pike, perch and panfish. As a lake becomes increasingly eutrophic, sport fish dwindle and carp abound. Eutrophic lakes are very fertile from all the nutrients carried into the lake from the surrounding landscape. These nutrients (phosphorous and nitrogen) support high densities of algae. Since eutrophic lakes have so much biomass, there is a lot of decomposition occurring

at the bottom, which uses up oxygen. This can cause fish kills when there is not enough oxygen for the fishery to survive.

It is clear from these definitions that the preferred classification is mesotrophic. It is the "sweet spot" where a lake has relatively clear water but enough nutrients to support an aquatic plant environment that is necessary for a healthy, diverse fishery. Yet there are not too many nutrients to cause algal blooms, fish kills, and murky water.

Can you guess how Shawano Lake is classified? If you guessed mesotrophic you are correct! That's the good news. The bad news is that we are at the upper levels of mesotrophic, bordering on becoming eutrophic, and have been for at least the last 25 years. Unless we are diligent in actively working to limit nutrient loading in Shawano Lake, it is very possible that our lake could become eutrophic.

Unfortunately, once that occurs it is very difficult to return a lake to a mesotrophic classification, and could take decades to accomplish. Here is a picture of an algal bloom from Cedar Lake in Polk County, WI. This is what we DO NOT want Shawano Lake to become.



How can we be proactive to ensure Shawano Lake stays mesotrophic? SAWM has several volunteers that monitor the water quality of streams that flow into Shawano Lake throughout each summer. We send water samples to a Madison lab for testing. This provides us the historical information that allows us to identify increases in nutrient loads and take actions to identify and hopefully address the source. As waterfront property owners, you can take steps to ensure that your property is not contributing to the problem. By limiting the amount of nutrients on your property, and by restricting the flow of nutrients from your shoreline to the water, you are doing your part to ensure Shawano Lake stays clear, healthy and mesotrophic! Below are a couple of ways to contribute.